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Practice Questions:EnglishMathReadingScienceWriting

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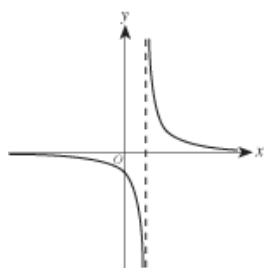
SAMPLE MATHEMATICS TEST QUESTIONS

[DIRECTIONS](#) ►

Click on the letter choices to determine if you have the correct answer and for question explanations.
An actual ACT Mathematics Test contains 60 questions to be answered in 60 minutes.

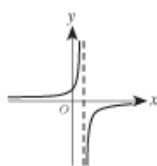
Set 5

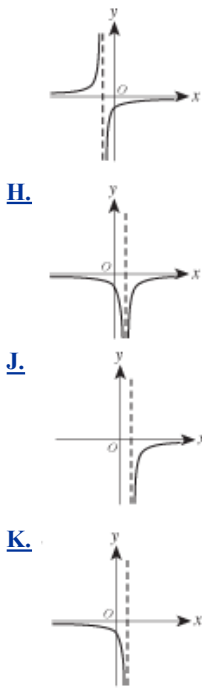
- Ms. Hernandez began her math class by saying:
I'm thinking of 5 numbers such that their mean is equal to their median. If 4 of the numbers are 14, 8, 16, and 14, what is the 5th number?
What is the 5th number Ms. Hernandez is thinking of?
[A.](#) 13
[B.](#) 14
[C.](#) 15
[D.](#) 16
[E.](#) 18
- The graph of a certain hyperbola, $y = h(x)$, is shown in the standard (x,y) coordinate plane below.



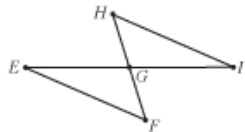
Among the following graphs, which best represents $y = -h(x)$?

[F.](#)





3. In the figure below, $\angle H \cong \angle F$; E , G , and I are collinear; and G is the midpoint of \overline{FH} .



To prove that $\overline{HI} \cong \overline{FE}$ given the conditions stated above, which of the following is a logical order for the 5 steps in the table below?

Statement	Reason
1. $\overline{HG} \cong \overline{FG}$	The midpoint of a line segment divides the segment into 2 congruent segments
2. $\angle EGF \cong \angle IGH$	Vertical angles are congruent
3. $\triangle GHI \cong \triangle GFE$	Angle-side-angle congruence theorem
4. $\angle EGF$ and $\angle IGH$ are vertical angles	Definition of vertical angles
5. $\overline{HI} \cong \overline{FE}$	Corresponding parts of congruent triangles are congruent

- A. 1, 2, 3, 4, 5
B. 1, 2, 3, 5, 4
C. 1, 2, 4, 3, 5

D. 1, 4, 2, 3, 5

E. 1, 5, 4, 2, 3

4. Each of the variables t , w , x , y , and z represents a different *positive* real number. Given the equations below, which of the 4 variables w , x , y , and z necessarily has the greatest value?

$$1.23w = t$$

$$1.01x = t$$

$$0.99y = t$$

$$0.23z = t$$

F. w

G. x

H. y

J. z

K. Cannot be determined from the given information

5. Which of the following is equivalent to $\frac{5}{k} + \frac{k+3}{k+5}$?

A. $\frac{k+8}{2k+5}$

B. $\frac{k+8}{k(k+5)}$

C. $\frac{5(k+3)}{k(k+5)}$

D. $\frac{k^2+3k}{5k+25}$

E. $\frac{k^2+8k+25}{k(k+5)}$

6. In the 2×2 matrix below, b_1 and b_2 are the costs per pound of bok choy (Chinese greens) at Market 1 and Market 2, respectively; r_1 and r_2 are the costs per pound of rice flour at these 2 markets, respectively. In the following matrix product, what does q represent?

$$\begin{bmatrix} 0.5 & 0.5 \end{bmatrix} \cdot \begin{bmatrix} b_1 & r_1 \\ b_2 & r_2 \end{bmatrix} = \begin{bmatrix} p & q \end{bmatrix}$$

F. The cost of r_1 pounds of rice flour at \$0.50 per pound

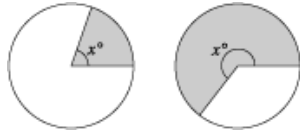
G. The cost of a half-pound of rice flour at Market 1

H. The total cost of a half-pound of bok choy and a half-pound of rice flour at Market 1

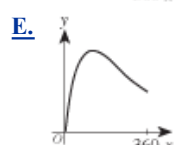
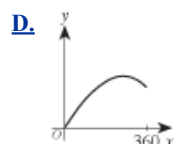
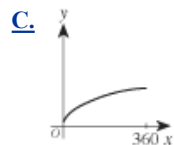
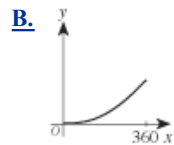
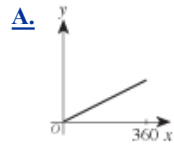
J. The total cost of a half-pound of bok choy and a half-pound of rice flour at Market 2

K. The total cost of a half-pound of rice flour at Market 1 and a half-pound of rice flour at Market 2

7. The 2 diagrams below show a circle of radius 1 inch with shaded sectors of angle x° , for 2 different values of x .



One of the following is the graph in the standard (x,y) coordinate plane of the area, y , of a shaded sector with angle x° , for all values of x between 0 and 360. Which is that graph?



8. If $h(x) = x^3 + x$ and $g(x) = 2x + 3$, then $g(h(2)) = ?$

- F.** 7
G. 10
H. 17
J. 19
K. 23

9. In the figure below, points A and B are on opposite banks of a small stream. Point C is on the same bank of the stream as point B and approximately 18 meters from B . The measure of $\angle CBA$ is 45° , and the measure of $\angle BCA$ is 60° .



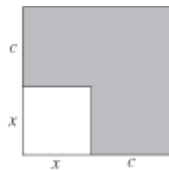
Which of the following expressions gives the approximate distance, in meters, between point A and point B ?

(Note: For $\triangle PQR$, where p , q , and r are the lengths of the sides opposite $\angle P$, $\angle Q$, and $\angle R$, respectively,

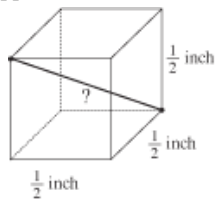
$$\frac{\sin \angle P}{p} = \frac{\sin \angle Q}{q} = \frac{\sin \angle R}{r} .)$$

- A. $\frac{\sin 60^\circ}{18 \sin 45^\circ}$
- B. $\frac{\sin 60^\circ}{18 \sin 75^\circ}$
- C. $\frac{18 \sin 45^\circ}{\sin 60^\circ}$
- D. $\frac{18 \sin 60^\circ}{\sin 45^\circ}$
- E. $\frac{18 \sin 60^\circ}{\sin 75^\circ}$

10. Each side of the smaller square in the figure below is x inches long, and each side of the larger square is c inches longer than a side of the smaller square. The area of the larger square is how many square inches greater than the area of the smaller square?



- F. c^2
 - G. xc
 - H. $4c$
 - J. $(x + c)^2$
 - K. $2xc + c^2$
11. A cube with edges $\frac{1}{2}$ inch long is shown below. What is the length, in inches, of a diagonal that runs from one corner of the cube to the opposite corner?



- A. $\frac{1}{4}$

- C. $\frac{3}{4}$
D. $\frac{3}{2}$
E. $\frac{\sqrt{2}}{2}$
F. $\frac{\sqrt{3}}{2}$

12. Which of the following is equivalent to $\sin \theta \csc(-\theta)$ wherever $\sin \theta \csc(-\theta)$ is defined?

- F. -1
G. 1
H. $-\tan \theta$
J. $\tan \theta$
K. $-\sin^2 \theta$